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In Union Is Strength

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National Farmers Union

Submission

to the

House of Commons
Standing Committee on Agriculture *code*

on the subject of

Farm Input Costs

presented in

Ottawa, Ontario

March 25, 1987



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Farmers are caught in a serious cost-price squeeze. In farming that is not a unique circumstance. It has happened numerous times before as a result of disparity between costs and prices and farmers generally have been able to survive. The cost-price squeeze of the 1980s has been much more insidious and damaging. Thousands of farmers have already been forced out of agriculture and thousands more are on the cutting edge of insolvency.

There has seldom been a time in our history when the economic hardship confronting the farm community has been so widespread or so severe. Most present day farmers did not directly experience the ravages of the Great Depression but for many today the stakes are equally as high.


The level of mental stress and anguish has risen sharply. Family violence and breakdown has increased. The farm suicide rate is estimated to have tripled since 1981.

The scenerio for the present day malaise in agriculture may run much deeper than the issue of farm input costs, per se. Statistics after all, can blur the facts. They suggest farmers were never better off economically than in 1986.

Farm cash receipts of \$20.2 billion were a near record. Operating expenses were actually lower than in 1985 or 1984. As a percentage of cash receipts (65.3%), operating expenses were the lowest since 1979. Realized net income estimated to be over \$4.6 billion for 1986 is a record high.

The 1986 index for farm input prices in Canada is reported as 108.6 (1981 = 100) suggesting that input prices have risen on an annual

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average of only 1.4 points between 1981-86.

Closer examination of the sources of cash receipts in 1986 indicate \$859 million and \$560.6 million respectively were paid out through the Western Grain Stabilization Fund and Crop Insurance programs. A portion of both of these payments, mostly made in Western Canada, were money paid out as premiums by farmers, but the size of the payments indicates they were precipitated by disastrous income problems which we know were caused by serious drought conditions in some areas and sharply declining world grain prices. In Manitoba these payments accounted for 9.5% of total cash receipts while in Saskatchewan and Alberta they represented 18.7% and 10.1% respectively.

The Farm Input Cost index indicates certain farm input costs have risen very sharply since 1981 while others have actually declined.

Building and fencing supplies index for 1986 is 127.4.

The machinery and motor vehicles index is 117.6; supplies and services, 124.6; hired farm labour, 125.7; property taxes, 138.6.

The crop production index at 102.9 showed declines in fertilizer costs but sharp increases in pesticides and crop insurance premiums.

The animal production index at 106.8 shows heavy increases in feeder livestock prices and hogs but sharp declines in feed grains.

FEDERAL POLICIES AFFECTING FARM INPUT COSTS:

Several federal policies bear directly on farm input costs and have done so for many years. A number of manufactured goods such as building supplies, fertilizers and chemicals are subject to federal taxes and in many provinces, provincial sales taxes apply as well.

We believe taxation on inputs directly used in the production of agricultural products contributes substantially to the costs of food production. The federal government has to some extent recognized this through its farm fuel rebate program.

In his February 18 Budget Speech, Finance Minister Wilson stated: "The federal sales tax is unfair and inefficient." - and noted that: "tax reform will make our tax system more fair, less complex and more understandable".

To make the sales tax more fair for farmers would be to remove it from farm input costs. We strongly recommend that forthcoming tax reform include measures for removing such taxes from farm input costs.

Most farm inputs are controlled through administered pricing and in some cases products such as herbicides are protected by patent. Your committee at an earlier session heard of the attempts by the newly formed Focus on Inputs Association Inc. to produce and market a generic version of the herbicide, Roundup, which is produced and marketed by Monsanto and protected by patent until 1990. The same chemical could be marketed as a generic version for about 25% of the patented product. Whether or not it will succeed in eventually being marketed is uncertain at this time but there undoubtedly are other parallel cases.

The Roundup illustration serves as a reminder that government, through its protection of privilege in patents legislation, is currently pursuing a policy of contributing toward higher farm input costs. Bill C-22, dealing with amendments to drug patents, will also affect the future costs of new types of veterinary medicines.

The government's commitment toward introducing private plant breeders' patent rights legislation is a very clear commitment toward encouraging future cost increases to farmers of new seed varieties. The move toward extending greater power and protection to the multinational seed companies through patenting holds very serious implications for the future of farm families and points clearly toward the pursuit of an even greater industrialization policy toward agriculture.

While this hearing is not intended to specifically deal with the patent rights issue, discussion is now broadening into the possible patenting of production formulas and specific genes as intellectual property. It is a topic that requires introduction. Much of our investment in public research programs and researchers themselves will be lost to the private sector.

Recently Dr. Wally Beversdorf of Guelph University was hired by Allelix Inc. to head up its research team. Beversdorf, as a paid government researcher before being hired by Allelix, developed a canola variety that could survive herbicides sprayed on fields to kill weeds.

Dr. Rob Rennie, one of Agriculture Canada's top research scientists, has been working at the Lethbridge Research Station until recently to develop a wheat variety that would fix its own nitrogen supply out of the soil. He is still working at the Station on the same project but as an employee of Imperial Oil. If and when his project is complete and nitrogen fixation wheat becomes a reality, Imperial Oil will own the rights - not the people of Canada. Farmers will pay the price because we have no way of passing added costs to the prices we receive for our products.

Not all seed varieties grown under patent rights protection in other countries are hybrids. But private corporations, Allelix among them, is seeking much broader legislation than the mere patenting of new seed varieties. Their objective is to gain exclusive ownership of a plant's genetic formula which is a much more sweeping step than patenting a drug formula, for example. (See Appendix A) Allelix, it should be noted, was founded by the Canada Development Corporation, Ontario government and John Labatt Ltd.

Applying industrial patents to living organisms is relatively new. In 1985 a U.S. court granted the first industrial patent for a higher plant, a variety of corn. Since then, the Americans have been patenting biotechnological techniques, plant parts and even genes themselves.

We are greatly concerned that forthcoming legislation on plant breeders' patenting rights will represent the beginning of much broader patenting rights in the biotechnology field. This would hold profound implications for the future of farming in Canada. This threat is of particular importance in the context of current free trade discussions with the United States and the mutual desire to harmonize policies between the two countries. The implications of patent rights legislation for the industrialization and control of food production are both ominous and real. (See Appendix A re: biotechnology impact on U.S. agriculture)

It is incumbent upon political leaders and politicians generally to understand the implications of legislation they pass and actions they take. The speed at which the scientific world is moving in the biotechnological field is far outstripping the understanding and comprehension of ordinary people, including politicians. It is meaningless for governments to continually give lip service for the need to protect the family farm when through legislation farm families are being sacrificed to technology.

We strongly recommend you support our position in opposing the introduction of private plant breeders' patent rights in Canada and support the full re-establishment of our publicly-funded plant breeding efforts.

Cost recovery is also a federal innovation which is raising farm production costs. While government was not able to implement cost-recovery charges as quickly as it had intended following the Nielsen Task Force review, \$11.8 million is expected in the 1987-88 fiscal year, \$13.1 million and \$14.3 million in the two following years. These cost-recovery programs should be cancelled.

We know that whether cost recovery is directly extracted from farmers or imposed at another point in the chain of bringing food from producer to consumer, the farmer is inevitably the one who pays the cost.

The passage in November, 1983, of Bill C-155, the Western Grain Transportation Act, has set the stage for sharply rising grain transportation costs for producers. A sharp increase on the farm share of grain freight costs is possible on August 1st unless the federal government again freezes the rate as it has done in the past two years.

Quite clearly grain prices do not reflect farmers' ability to pay higher freight rates. These rates should be again frozen for the 1987-88 crop year.

The W.G.T.A. with its provisions for variable freight rates and subsequent encouragement for abandonment of branch rail lines rendered uneconomic as the centralization of grain deliveries is encouraged, will result in transferring an increasing cost for grain

transportation upon the rural community. Efficiencies and cost savings in grain handling and transportation will accrue to the elevator and railway companies at the expense of farmers affected by the resulting loss in services.

Bill C-75 proposing changes to the Canada Shipping Act also contained cost-recovery provisions which affect grain shipping costs through the St. Lawrence Seaway and other farm commodities such as potatoes and livestock moved by ship from Prince Edward Island to the mainland. These new costs were suspended for one year but are again scheduled to take effect. They should be suspended indefinitely.

A major dilemma to confront farmers for at least eight years has been the usurious level of interest rates on farm loans. The double-digit levels commenced on Farm Credit Corporation loans in 1979.

Two 1967 amendments to the Bank Act were particularly significant. The abolition of the interest rate ceiling on loans provided flexibility for the banks. The second amendment permitted banks to make mortgage loans. The increase in National Housing Act (NHA) and conventional mortgages and, since 1977, agricultural mortgages can be attributed to this change.

Farmers' troubles began soon after. In April, 1980, our organization first met with a federal Cabinet committee requesting the government deal with the farm debt crisis that was then strongly in evidence in Central Canada and the Maritime provinces. Nothing was done. The situation has grown progressively worse. Thousands of farmers have lost their farms and possessions. The numerous calls for farm debt moratorium legislation have been ignored or refused.

Government has consistently bowed to pressure to take no action from the chartered banks. Ominous warnings of banks cutting off credit to farmers was issued which, of course, they have done for years on an increasingly selective basis.

Last year the Farm Debt Review Act was passed. We regard it as a truly ineffective instrument in dealing with the economic problems confronting farmers. Essentially, it is a vehicle to grease the skids for moving farmers out of farming with the bank creditors holding the

ultimate power of life or death over the fate of farmer debtors. The Farm Credit Corporation, too, is availing itself of the Debt Review process to deal with some of its more than 19 thousand delinquent accounts.

Within recent months, there is growing evidence that the chartered banks have grossly overcharged an unknown number of farmers for interest payments by illegally converting fixed interest rate notes to floating rates at a time when interest rates were spiralling upward. A case heard before an Ontario court last year ruled this was wrong. More recently an Alberta bank settled out of court for over \$200 thousand in a similar case.

Why should aggrieved farmers need to resort to court action? The Bank Act is federal legislation. When there is evidence such as the two cases referred to that indicates chartered banks and lending institutions have violated the law and overcharged borrowers, an order should be directed to all lending institutions directing them to make immediate restitution. Billions of dollars may be at stake - not only overcharged farm borrowers may have been affected but others as well, such as small businesses. Government must not turn a blind eye to this issue. It may represent the greatest financial swindle and fraud in Canadian banking history.

We request this committee issue a firm recommendation to the appropriate government department and authority to fully investigate this interest rate scandal with the objective of providing full restitution to all injured parties.

THE FARM INCOME ISSUE:

Farm input costs in reality are only one part of the serious economic problem in agriculture. The current depressed level of farm prices is a much greater factor for concern.

The Farm Product Price index in January, 1987, stood 5.2% lower than the year earlier level of 93.8 (1981 = 100).

While the livestock and animal products index in January stood at 3.7% above the level of one year ago, hog prices declined by

13.9% in January, 1987 and have fallen by 26.6% since reaching their peak in August, 1986. Cattle prices in January rose 1.2% and are 7% above the year earlier levels.

The cereals index in January was 25.2% below year earlier levels while the oilseeds index has declined by 25.4% during the past 12 months.

As a result of the U.S.-E.E.C. grain trade price war, it has been estimated that the farm income shortfall in 1986 may have been as high as \$4 billion. Grain prices are a disaster and the possibility of further cuts in initial grain prices creates serious problems.

It has been a situation of serious enough concern to government to prompt it to pay, in 1987, \$1 billion to partially compensate grain producers for income shortfall. This obviously will be less than adequate in 1988.

Farmers this spring face a very uncertain future. There are no realiable market signals on which to base their planting decisions as suggested by the Minister of Agriculture.

In order to plan their futures, farmers need positive signals and policies from government which can point them in the right direction. Our organization believes a target price - deficiency payment program needs to be structured which will provide producers with the appropriate signals. An immediate announcement of government assistance levels for 1988 is needed now.

Delegates attending our 17th Annual Convention in Winnipeg, December 1-5, 1986, unanimously passed a six-point proposal asking that we:

a) Urge the federal government implement a target price - deficiency payment support program for 1986-87 crop year to cover the eight major grains and oilseeds suffering greatest injury as a result of the price war;

b) Request that target prices for grains and oilseeds marketed in 1986-87 crop year be established at levels comparable to those received by U.S. producers;

c) Request that the level of deficiency payments paid to producers be determined by the amount of shortfall experienced between market prices and target prices;

d) Request that the target price programs remain in place until such time as normal world trading relations and marketing conditions resume;

e) Propose that a \$50,000 upper limit be placed on the amount of deficiency payments that will be paid to any one producer in each marketing year;

f) Urge that the marketing of the grains and oilseeds included in this proposal be placed under the marketing jurisdiction of a Canadian Grains Board.

We request your support for this proposal in the belief that farmers require more than ad hoc programs and vague commitments from federal Ministers on whether future assistance payments can be expected. Farmers are unable to plan production programs when crops they may be anticipating on producing are not even able to return cash costs of production. A principled and responsible policy approach has never been needed more by farmers than at the present time.

FREE TRADE ISSUE:

The current negotiations between Canada and the U.S. on a free trade agreement between our two countries has presented us with considerable concern on how such an arrangement would affect agriculture. The bottom line to a free trade arrangement in our view spells lower prices for farm products and less income in total.

While we recognize the importance of the U.S. market to Canadian trade initiatives in general and the fact that about 75 per cent of our exports are to that country, only about 22 per cent of our agricultural exports are sold to that country.

We support separate-sector export agreements for commodities such as cattle, hogs and processed meat with the U.S. but very much bear in mind that the U.S. is a major competitor on world markets for grains, oilseeds and processed products of those commodities. It would

be foolish to totally place all our "eggs in one basket" and become even more a trading satellite of the U.S.

The March 11th First Ministers' Meeting heard a report on the current state of negotiations but apparently no real substance on what trade-offs the U.S. are demanding in exchange for our willingness to remove such aggravations as countervailing duties and tariffs.

The Prime Minister has publicly stated any agreement with the U.S. would have to satisfy the regions. He has also stated farm marketing boards would not be affected but this does not satisfy the need for clarifying the future status of government agencies such as the Canadian Wheat Board, a crown corporation; the Canadian Grain Commission, a regulatory agency; or the Canadian Dairy Commission which administers dairy quotas and subsidy payments. If these agencies and their current functions survive, we should no longer confuse the issue by referring to it as free trade. Rather, it is a form of trade enhancement.

We request your support for the maintenance of a strong trading relationship with the U.S. without the surrender of orderly marketing institutions and sovereignty rights on policy issues.

CONCLUSION:

We appreciate the opportunity provided by this meeting to express some of our thoughts and concerns on the farm input - farm income issue. We express the hope that it will increase your awareness of the important role parliamentarians fill in affecting and influencing the lives of farm people.

All of Which is Respectfully
Submitted by:

NATIONAL FARMERS UNION

APPENDIX A

SEEDS OF DISCONTENT

In a shining white laboratory building within earshot of Toronto's main airport, Wally Beversdorf plays with life. Under his direction, a cosmopolitan band of scientists labors each day to unravel the mysteries of plant genetics and bend them to human purposes. Challenging and complicated as it is, though, the science and engineering of developing a new plant variety is not the biggest headache faced by Beversdorf and his bosses at Allelix Inc. The real challenge is to ensure some financial payoff.

Selling seeds is a \$136-billion business worldwide, and recent advances in genetic science and engineering have launched it into what promises to be an era of explosive growth. If Canadian companies can cut themselves in on the action, the country will benefit not only in terms of jobs and sales but from the spinoffs in knowledge and technology. Without the best research effort, on the other hand, Canadian farmers may well find themselves worse off competitively than they are now, as growers in other countries reap the benefits of new plant varieties that produce well in their climate and soil but perhaps not so well in Canada.

As things stand, Canada will not get the best possible effort in high-technology plant breeding because politicians have not faced up to the need to make the research work pay. Almost alone among the Western developed nations, Canada has never extended any form of patent protection to seed breeders. That means companies like Allelix – unlike most inventors, who can patent their discoveries and charge royalty fees to anyone who wants to copy the design – have no ownership rights to the plant varieties they develop.

There are convincing arguments why no one should own an outright patent on living organisms. But there also is a good case for giving some measure of proprietary

rights to those who develop a new plant that has economic value to other people. After years of neglecting the issue, Canada's federal legislators need to put plant breeders in this country on the same competitive footing as those elsewhere in the industrialized world.

The distortions in research caused by Canada's present legislative vacuum are obvious from a visit to the Allelix lab in the Toronto suburb of Mississauga. What Wally Beversdorf's team is trying to do there is develop an improved variety of canola, a grain that was little known four decades ago but now is a \$1.5-billion-a-year crop for Canadian farmers. Canola provides half of the edible oil consumed in this country. In scientific circles, Beversdorf is almost synonymous with canola: **As a government-paid researcher before he came to work for Allelix, he gave canola growers a big boost financially by developing a variety of the plant that could survive herbicides sprayed on fields to kill weeds.**

Created in 1981 with \$90 million in government and private financing, Allelix has done a lot to propel Canada into the futuristic world of genetic engineering. But it would never have financed the research that first brought fame to Beversdorf, because the lack of patent protection would have prevented the company from collecting royalties on the results. Under the present law, anyone who buys seeds once can grow the herbicide-immune canola this year and forever after simply by saving some of his crop for replanting.

To make the best of a bad situation, Allelix has had to go another route, **seeking to develop a canola that will do everything a farmer wants it to except remain genetically faithful.** That sort of plant – known as a hybrid because it can be obtained only by genetic crossing of two other plant varieties, in contrast with

plants that will breed true from their own seed – **would force anyone wanting to grow it to buy seed every year from Allelix or its licenced agents.**

If all that seems like a sinister plot against the farmer, Allelix and other seed companies can quite rightly argue that any hybrid has to be worth its price in increased yields or the farmer won't buy. The troubling thing is that the hybridization niche is the only place Canada's seed breeders now see any return for themselves. Says John Evans, the former university president who heads Allelix: "A country has to think what signals it's giving to industry. If it's going to selectively refuse to recognize invention with a patent then it's giving a signal it doesn't place much value on that."

The only legal protection for the developer of a new plant variety is Canada's Seeds Act, which simply prohibits other growers from selling their seed under the varietal name – the official name assigned to a particular genetic type of canola or other plant species. With a typical bill for developing a new plant variety running at \$3 million and so little incentive for risk-taking, it is not surprising that most new varieties of plants now being developed in Canada come from government-financed laboratories. Continued heavy government involvement is inevitable because private enterprise, even with the assurance of some form of plant breeder's rights, is unlikely to see profit in many areas of research. (Wheat, for instance, is a major crop but a poor bet for breeders, since about 60% of Canadian and U.S. acreage is planted with seed from the previous year's harvest.)

But the prospective gains for Canada from getting more entrepreneurial money into plant breeding has persuaded most of the interests directly concerned – breeders, farm organizations, government officials

and university experts – that the law needs to be changed. Nor are the attractions entirely economic. Recent advances in scientific knowledge and hardware have made it possible to achieve genetic change in plants much more swiftly, by slicing just the desired genes from the chromosome of one plant and inserting them directly into that of another, instead of awaiting the tediously slow results of traditional plant breeding. As yet, gene-splicing is still in its infancy, but it could produce plants that, for instance, will yield the same amount of food with less fertilizer and less water. Not only would that be cheaper, but there would be less environmental contamination and less pressure on supplies of fresh water.

What will move research toward that future? Evans of Allelix and other advocates of plant patenting say only legal ownership of what they invent will give them enough assurance to tackle some of the more difficult challenges in the field. They say their situation has much in common with the one pharmaceutical companies found themselves in when the previous Liberal administration in Ottawa limited their patent rights and royalties to increase competition in drug pricing. That took away much of the financial incentive for developing new drugs, and the outcry from frustrated companies has finally pressed the Mulroney Government into introducing legislation to restore patent protection for at least the first seven years a drug is available.

But giving someone exclusive ownership of a plant's genetic formula would be a much more sweeping step than patenting a drug formula. Plants come only from other plants, no matter how sophisticated the technique of genetic rearrangement. Researchers endeavoring to produce new varieties depend on access to existing varieties for their raw materials, and those who oppose patenting argue that access could well be cut off by a patent owner anxious to avoid competition. In theory, patent owners could deny permission or demand prohibitive royalties from anyone wanting to use patented gene combinations.

Applying industrial patents to living organisms is a relatively new and untried approach. In 1985 a U.S. court granted the first industrial patent for a higher plant, a variety of corn. Since then the Americans have been patenting biotechnological techniques, plant parts and even genes themselves. As is typical in a new area of technology, the patents given are phrased

in broad terms – tantamount to giving the first car maker a patent for a four-wheeled vehicle with an internal combustion engine. Most experts anticipate that the early plant patents will be whittled away in the courts as patent holders sue those they believe are infringing their rights.

Canada has not yet granted an industrial patent for a plant, but it has taken the significant step of patenting a living organism. In 1982 forest products company Abitibi-Price was granted a patent for an organism that helps purify waste from wood pulp manufacturing. Seed producer Pioneer Hi-Bred International Inc. subsequently applied to patent a variety of soybean, and when the patent office decided the plant was not an invention the decision was appealed to the Federal Court, which has yet to rule on the question. If Canadian courts were to follow the U.S. lead, Canadian companies facing competition from patent-protected U.S. firms would feel relief.

Many plant breeders and even the seed growers and trade associations, however, believe patenting plants as if they were industrial inventions is going too far. They fear that patents could give one or a few companies too much control over crucially important genes or an area of biotechnology. That concern is felt even among executives of some of the biggest corporate players in the field, such as Ken Campbell of Ciba-Geigy, a multinational producer of agricultural chemicals with a burgeoning presence in plant breeding. Says Campbell of the U.S. trend in patenting: "If things don't change, nobody'll be able to do anything." Wilf Bradnock, director of the federal Agriculture Department's seeds division, says he's alarmed by the implications of plant patenting. "It works against the pattern of research, which is a mosaic with each breeder working on the developments of others."

Short of outright patenting, what can be done? The answer is to legislate plant breeder's rights, a modified form of patent that has been around in Europe and the United States for 50 years and has been found to offer an incentive without giving too much power to any one company. Like the industrial patent, breeder's rights would give ownership of a variety to those who developed it. The impact on research and farming, however, would be much less frightening. Any protected variety would continue to be freely available for further research and breeding. Farmers would have to pay a royalty whenever they bought seed

represented as being of a particular variety, but they could replant some of what they grew without further royalties – or even sell seed as long as they did not use the varietal name.

Nothing in that approach would be a radical change in philosophy from the system as it is supposed to operate now. The crucial differences would be that the breeder of a plant variety would have the right to collect a royalty any time seed was sold by the varietal name, and that he could file suit for damages in civil court if anyone else infringed his right. At present the only legal clout to deter misuse of a varietal name rests with the Government through enforcement of regulations under the Seeds Act, whose intent was simply to protect seed buyers against misrepresentation of a product. If a farmer flouts the existing law and sells seed under its varietal name – Mingo barley, for instance, instead of just barley – the breeder who developed the variety can do nothing except hope the Government will prosecute.

Partly because officials suspect the Seeds Act might not stand up in court, enforcement has been anything but vigorous. Bill Leask, executive vice-president of the Canadian Seed Trade Association, says, "The Government has successfully prosecuted one case. I bet I could find 20 violations (of the law on varietal-name sales) in *The Western Producer* today."

Besides allowing a breeder to sue for such abuses, breeder's rights legislation would improve both the competitiveness of Canadian companies in foreign markets and the access of Canadian agriculture to the best available seeds. About 20 countries now subscribe to an international convention under which each country recognizes the varietal rights of plant breeders in all the other countries. Because Canada doesn't offer effective legal protection for new varieties, however, some foreign companies are reluctant to sell their seed in this country. And because Canada doesn't have plant breeder's rights, varieties developed in Canada cannot be protected in other countries.

Bradnock of the federal Agriculture Department has been recommending breeder's rights legislation for years. A bill actually was introduced in Parliament in 1980 but got no further than routine first reading and died on the order paper when the session ended. The current Agriculture Minister, John Wise, says he has Cabinet approval to try again, but he refuses to be more specific about the content or timing

of his legislation.

To get a law passed, politicians will have to face up to some controversy. The most outspoken critic probably will be Pat Mooney, a self-taught expert from Manitoba who sees himself as a champion of the poor in the Third World. Mooney opposes any form of plant patenting, which he sees as an extension of the powers of multinational giants in agricultural chemicals such as Ciba-Geigy, Monsanto, Pfizer and Shell, all of which have diversified into the seeds business. Mooney argues that it is not in the interest of those companies to develop crops that will need fewer chemicals. "There's a real danger we'll get railroaded by these companies. They'll say, 'If you want to move into the 20th century and cure your father of cancer, you'd better allow patents.' " If a few big players were the only source of new plant varieties, Mooney would have a point. But as long as researchers have free access to any existing variety for their work, government, universities and smaller companies will make sure

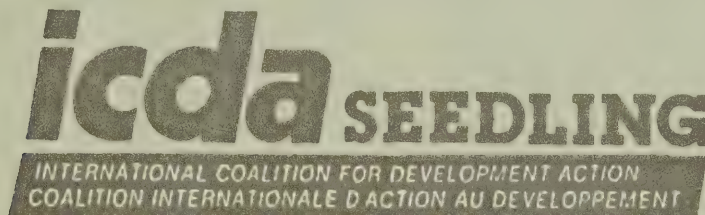
farmers have a choice of what varieties to plant to achieve their goals. To be sure, farmers may pick varieties that in combination with chemical fertilizers and pesticides will only add to the mountains of surplus food in the world, but that is not the fault of the plant breeders, who will simply be producing what their customers want to buy.

Although they may not share Mooney's reasons, there also are farm groups that oppose plant breeder's rights. Their main objection is not the prospect of having to pay royalties, an obligation that would add about 10% to the cost of seed (and therefore 1% to the total cost of growing a grain crop). Instead, they worry that the legislation would mean a diversion of money away from plant breeding, with government assuming its effort is no longer needed and business failing to fill all of the gap.

Even with legislative change, however, no one should count on a flash flood of private investment into plant breeding. The first beneficiaries are likely to be Canadian

farmers, as seed companies abroad, discovering they can collect royalties in the Canadian market, make improved varieties available here.

In the long run, more money can be expected to gravitate to plant breeding in Canada because, as Leask of the seed trade association observes, "it's the exception rather than the rule that varieties developed elsewhere will fit Canadian elements." Patience is needed to grow anything, but without the legislative seed now there will be no economic harvest later. ♦



■ JULY 1986

MAJOR REPORT ON BIOTECHNOLOGY IMPACT ON U.S. AGRICULTURE

The office of Technology Assessment (OTA) of the Congress of the United States, published recently a report on the impact of new technologies on the structure of US agriculture. While stating that a whole range of different production techniques is going to affect American agriculture in the next decades, the report focuses on the areas that are expected to have the most profound impact: biotechnology and information technologies.

Putting these technologies in their historical context, OTA considers them as even more powerful and far reaching than the "mechanical era" of the first half of this century that allowed farmers to make the transition from horsepower to mechanical power, and the "chemical era" of 1950 to 1980 that further increased productivity through increased use of pesticides and

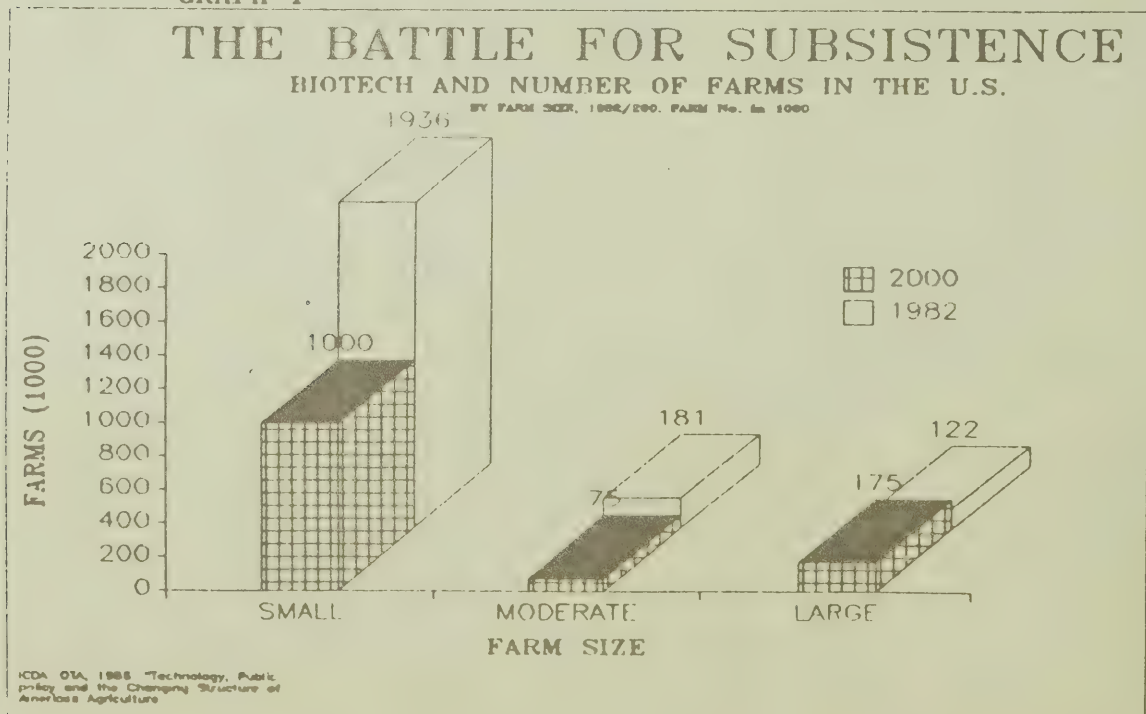
chemical fertilizer. "Now, in the 1980s, American agriculture is being propelled by a new major technological thrust - the biotechnology and information technology era. The effects of this new era on agricultural productivity may be more profound than those experienced from either the mechanical or chemical eras" The driving force behind this profound impact on farm structure, according to the report, is the fact that biotechnology - more than any other technology - enables agricultural production to become more centralized and vertically integra-

ted. Biotechnology leads to further resources concentration. This process is already becoming clear now in the biotechnology industry. While this sector started off from small companies drawing from university research, now giant agro-industrial corporations are getting heavily involved in both research and marketing of biotechnology. These are the same corporations that already control important parts of the input and output sector of agriculture, like pesticides, fertilizer and seeds on the input side, and the product processing on the output side.

"An anticipated economic consequence of this increased control of production is an increase in the practice of contracting. Contracting allows husbandry and cultural practices to be monitored and controlled closely (by the industry) during the production process. This greater process control leads to uniform product differentiation."

What this all means to the American farmers becomes awfully clear in the report, illustrated with data and estimates. Between now and the year 2000, the total number of farms will be reduced dramatically, almost to half. Of the 2,2 million farmers in 1982, only 1,2 million will have survived by the year 2000! Although 80% of them will be small and part-time farmers, just 4% of the then still existing farmers (50.000), will produce over 75% of all agricultural production. Especially the small and moderate size farms will be thriven off the market (by the year 2000, 48% and 58% resp.) while the number of large farms will increase by 44%. (see graph 1.)

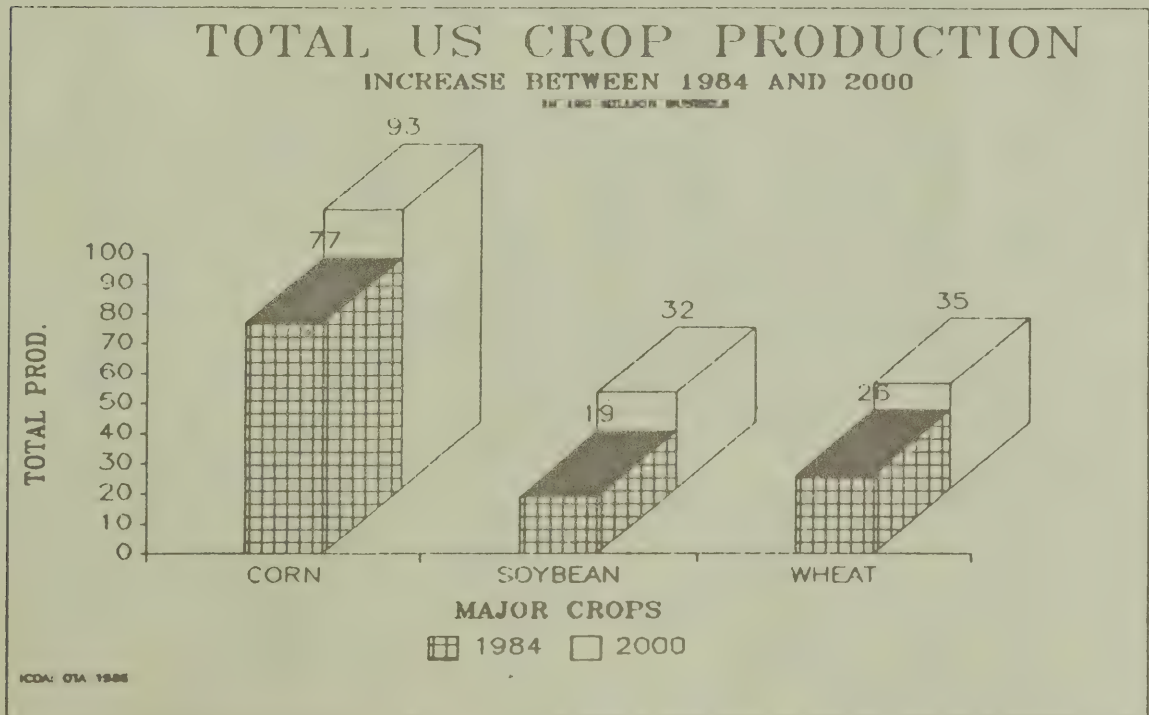
GRAPH 1



The conclusion is clear: biotechnology and the other new farm technologies as developed now, are most suitable for the larger farms, causing a disastrous situation for the small and moderate farms. Or in the words of the OTA report: "Generally, 70% or more of the largest farms are expected to adopt some of the biotechnologies and information technologies. This contrasts with only 40% for moderate-size farms and about 10% for the small farms. (....) Traditionally, the moderate size farm has been viewed as the backbone of American agriculture. These farms are failing in their efforts to compete for their historical share of farm income."

Taking a closer look at biotechnology itself, the report predicts that the immediate impacts will be field in animal production first. (OTA expects milk production per cow to be doubled before the year 2000!). The major impact on plant production will not be felt before the turn of the century. However, after the year 2000, the impact will be substantially greater for plant agriculture. The increase in crop production per hectare will be substantial however between now and the year 2000, taking into consideration that the real "biotech-boom" in plant agriculture will take place after the turn of the century. A report issued by the French embassy in Washington on the impact of biotechnology in the US, estimates a 30% growth of corn yield per hectare between now and 2000. Wheat yields per hectare will increase by 25%, and rice by 27%. These figures assume that the improvements through biotechnology go together with increased control of environmental factors (like irrigation, fertilization and pest control)

GRAPH 2



The basic problem with the OTA report is perhaps the assumptions that are made. While offering excellent data on the impact of biotechnology, it is stressed several times that the reason for adopting the new technologies is to meet the increasing world demand in the next 20 years, and to stay in the race with other competitors. The OTA report predicts a substantial growth in total US crop production up to the year 2000 (see graph 2), and an even more substantial increase in US crop production after the turn of the century. While, with the current population growth, increased food production is indeed important, the basic question is where this food will be produced and by whom. The population growth will take place in the Third World, and the "increased world demand" would thus come from those countries. What happens with the access to biotechnology among US farmers (where large farms can make use of the technology, while the less powerful are excluded), is likely to happen on world scale as well. If biotechnology is developed as OTA predicts (e.g. by large corporations for large farms), it will result in more surpluses in the North and more hunger in the South.

"Technology, Public Policy, and the changing Structure of American Agriculture". OTA, March 1986. Available from: Superintendent of Documents, U.S. government printing office, Washington DC 20402 (GPO stock No.: 052-003-01018-6)

The New Plant Genetics:

SEED WORLD

JUNE 1986

The Driving Force Behind The Restructuring Of The Global Seed Industry

by James W. Kent
L. William Teweles & Co.

Changes in the structure of the global seed industry . . . now to the year 2000, will be dramatic. Re-vamping of the trade and the companies involved will be more pronounced than foreseen a few years ago. Restructuring, which started in the 1970's, has reached full force in the past eighteen months.



Stimulating these moves is the powerful emergence of plant biotechnology and its interface with traditional plant genetics. In the past year, plant biotechnology has moved more quickly than earlier predicted.

Research leadership has become profoundly important and this is a major reason for participation in the seed industry by multi-national corporations. They have research orientation and financial capability to fund long-term science programs.

The driving force for entry into the seed industry by chemical,

pharmaceutical, food, and other large corporations have been the new plant genetic technologies of recombinant DNA and plant tissue culture. Their new plant science technologies are interrelated with other positive aspects of the seed trade:

- *Technology Outlet.* Seed is the delivery system for the new plant genetic technologies of recombinant DNA and plant tissue culture. Acquisition of a seed company is important for strategic planning, integration of the new science with whole plant breeding, multiplication of stock and

ultimately, distribution of new products.

- *A Growth Market.* Both domestically and internationally, the volume and dollar value of seed sown is growing annually. For example, U.S. seed consumption value alone increased by almost 30% from 1982 to 1985. This is due to high levels of genetic technology, proprietary varieties and plant variety protection.

- *An International Business.* Internationally, the increase in world population and affluence has increased expectations and appetites for meat and other food-stuffs. This has put pressure on breeding, multiplication and sale of high performance seed to produce additional crops. Seed trade leaders believe this growth will continue in the future.

For multi-national corporations, seed lends itself to worldwide commercialization. The U.S. is considered the principal source of genetic development. The successful international operations of present industry leaders lend credibility to the potential for worldwide seed organizations.

The global market for seed is very large, with \$51 billion consumed in 1985. However, only 63% (U.S. \$32 billion) of all seed planted is commercially supplied by companies and organizations formally engaged in the research, production, conditioning and marketing of seed. Commercially supplied seed excludes (a) the grain farmers save from a previous crop for future plantings and (b) seed passed directly from farmer-to-farmer.

The global market for seed commercially supplied is segmented in Table 1.

- *Minimal Regulation.* Government regulations of commercial seeds are not burdensome. They can, in fact, be considered constructive. Contrasted with food, pesticide and pharmaceutical FDA and EPA regulations, seed is relatively regulation-free. Seed research, multiplication, conditioning and marketing decisions are based upon good business judgment, and meeting reasonable regulatory requirements.

Table 1: The global market for commercially supplied seed segmented into national economics. Source: L. William Teweles & Co., Milwaukee, WI.

Economy	Global Commercial Seed Trade
Developed or Free Market Economies (U.S., Western Europe, Canada, Australia, Japan, etc.)	43%
Developing Market Economies (Africa, ASEAN, South America, etc.)	12%
Centrally Planned Economies (U.S.S.R., Eastern Europe, etc.)	45%

- *Seed is Ecology Plus.* Unlike many pesticides which are under attack by environmentalists, seed and the plant sciences are generally considered ecologically positive. The threat of withdrawal and/or recall because of politically-inspired pressures is unlikely with seed.

- *Protection for Innovation.* Because of the built-in protection of hybrids, the Plant Variety Protection Act of 1970 in the U.S., Breeders Rights in Europe and new U.S. patent protection, improved seed carries protection. For this reason, successful commercial innovation has the possibility of substantial rewards for the developer.

- *Financial Strength.* Other than the major corporations, much of the fragmented seed industry lacks the financial capability to sustain major research endeavors for breakthrough developments. Long-term marketing strategies of many medium-sized and smaller companies suffer from financial malnutrition. In addition to bringing financial strength to their seed acquisition, the corporations' tradition of professional management, "research patience" and

marketing skills will make their acquisitions formidable competitors.

- *Excellent Returns.* Based upon the performance of several publicly-held companies, seed industry after-tax return on sales and investment is believed to compare very favorably with those of the food, chemical and pharmaceutical industries. Contrary to many sectors of the economy, the seed trade has proven to be relatively recession and depression proof.

Fueled by economics of scale in marketing and by the potential advantages conferred by new genetic technologies, consolidation of the seed industry is underway. The base of acquirers is shifting. It includes not only companies basic in agricultural inputs (such as herbicides and fertilizer), but also companies in pharmaceuticals, food processing and biotechnology. Shortly after the year 2000, it is expected that 10 to 20 major companies will dominate the seed markets.

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